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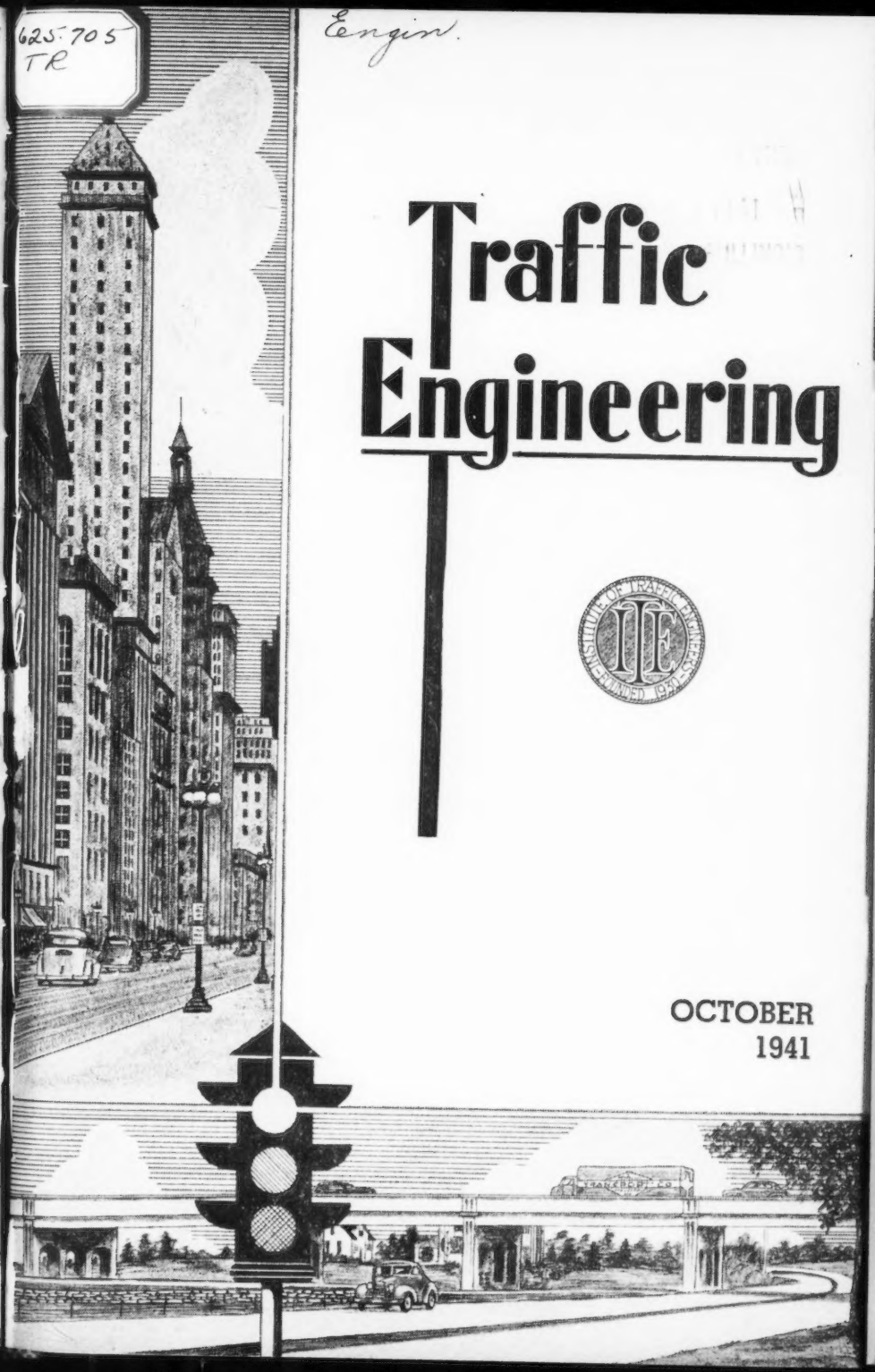

OCTOBER
1941

Traffic Engineering

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TRAFFIC ENGINEERING is published monthly by the Institute of Traffic Engineers, 60 John Street, New York City, N. Y. Permission to reprint contents with the customary credit line is freely given unless otherwise stated.

The subscription price is $1.00 per year in the United States and Canada. Other publications of the Institute of Traffic Engineers are the Annual Proceedings, $1.10, and City Traffic Engineering Departments, $.50.

VOLUME XII OCTOBER, 1941 NUMBER 6

Frankly Speaking

Traffic Engineers and National Defense

PRESIDENT ROOSEVELT recently issued a proclamation calling upon every citizen, in public or private capacity, to enlist in a nation-wide campaign to prevent wastage of human and material resources of the Nation through accidents. Traffic engineers are in the front line of this attack.

Defense priorities are making it more and more difficult to obtain materials for street and highway construction and for traffic control equipment. By July 1, 1942 defense industries are expected to be operating at maximum employment. This means increased traffic loads, a shifting of the traffic pattern and an acceleration in the movement of commodities and people. Many defense plants use the highways and streets as part of their assembly line. Traffic facilities in these defense areas must work at peak efficiency. With the inability to obtain sufficient materials, it will be impossible in many instances to build new traffic facilities or to physically improve those already existing. It is in this emergency that the traffic engineer can prove his value by obtaining greater efficiency from the present facilities.

Most of the present streets and highways must be expected to carry peak loads of traffic especially during shift changes at industrial plants; congestion around entrances and plant parking areas must be avoided; materials and supplies must flow freely between plants; and in the midst of all this, on occasion, troop movements must be provided for.

Traffic control signal systems must be improved, parking control must be established, traffic must be segregated and distributed along alternate routes, and in general, the overall efficiency of the traffic system must be improved if the emergency conditions imposed upon it are to be met successfully.

If the traffic engineer does his part and applies his knowledge and experience intelligently, streets and highways will be made to operate efficiently and with a minimum of congestion points and bottlenecks, traffic will flow smoothly and easily and we may expect to obtain greater safety of movement as a by-product of this more efficient operation.

D. Grant Mickle

President, Institute of Traffic Engineers

VOLUME XII OCTOBER, 1941 NUMBER 6

A PLAN FOR IMMEDIATE IMPROVEMENT OF DEFENSE PRODUCTION TRANSPORT

by INSTITUTE OF TRAFFIC ENGINEERS

CONGESTED highways are sabotaging the defense efforts of the United States.

Our streets and roads represent a critically weak link in the production line of national defense.

It is wasteful to spend billions of dollars for National Defense unless we can speedily move raw materials to factories, transport workers to plants as quickly as possible and deliver the finished products before it is too late.

Highway congestion is critical today. But when the defense program moves into full production, conditions on our highways will become intolerable in many areas unless we achieve the maximum use of existing facilities. This will mean less congestion and fewer accidents.

The Institute of Traffic Engineers therefore recommends the following steps as a MUST program in the interests of National Defense:

1. We must plan routes for defense workers and trucks;

2. We must reduce peak-hour congestion through staggering employment hours in defense areas; and

3. We must eliminate traffic bottlenecks.

The Institute of Traffic Engineers therefore recommends that the National Advisory Committee to the War Department urge each State, County and City to cooperate in carrying out the I.T.E. Plan toward accomplishing these objectives in places where the need exists.

This plan can cut defense traffic delay as much as 50% in many places.

I. Plan routes for defense workers and trucks

- A. Establish preferential routes for:
  - 1. Employees
  - 2. Trucks
  - 3. Mass Trasportation
- B. By-pass congested areas
  - 1. Relocate number routes
  - 2. Provide alternate by-pass routes
- C. Establish thru (stop) streets
- D. Establish one-way streets
- E. Resurface and repair streets

II. Reduce peak hour congestion in defense areas by:

- A. Staggering working hours
- B. Encouraging civilian traffic to avoid travel during rush hour periods

III. Eliminate bottlenecks

- A. Control or restrict curb parking and loading and provide off-street facilities
- B. Channelize traffic for orderly movement
  - 1. Lane marking
  - 2. Islands
  - 3. Intersection redesign
- C. Install and modernize traffic control devices
  - 1. Signals
  - 2. Signs
  - 3. Street marking
  - 4. Street lighting

This plan can be applied quickly and economically and if properly applied will provide maximum efficiency from the present system. There are other important new projects which are more costly and take longer to accomplish, but in instances are less costly and more practical than erecting temporary cities near temporary plants. Among these are express streets and highways, grade separations and the control of roadside development, which are of peacetime as well as defense value. These should be planned now.

Approved by the Institute of Traffic Engineers at the Twelfth Annual Meeting, Chicago, Ill., October 7, 1941 and endorsed by Congressman Clifford Davis, who will present the plan before the U. S. House of Representatives. Maxwell N. Halsey was appointed chairman of a committee to promote the plan.

THE STATE TRAFFIC ENGINEER IN NATIONAL DEFENSE

by ADOLPHUS MITCHELL

ROADS have always exerted an important influence on military campaigns. This is truer today than ever before because modern armies are highly mechanized. They are more important to the United States than to most other countries because with our long coast lines and land borders it would be impractical to maintain fixed defenses at all points of possible danger. It has, therefore, been necessary to base our plan of national defense primarily upon concentrating men and weapons within strategic areas and to depend upon our ability to shift these forces quickly and effectively to meet any threatened attack.

Since movement outside of actual combat areas will pass through areas under civilian control, it has been necessary to set up adequate machinery for the cooperation of civilian authorities with the military forces.

The Highway Traffic Advisory Committee was set up for the purpose of formulating general national policies concerning the arrangements for cooperation between the War Department and the several states. A state committee has been established in each state and is composed of three members. The membership ordinarily consists of the Motor Vehicle Administrator, the Chief of the Traffic Enforcement Unit and the Chief Executive of the State Highway Department.

The Motor Vehicle Administrator is the logical one to furnish driver records, data on the availability of commercial trucks and buses, etc. The Chief of the Traffic Enforcement Unit usually serves as contact man. The military commanders contact him for information furnished by all sources. He also furnishes police escorts and arranges for the control of traffic en route. The third member of the State Committee is the Chief Executive of the State Highway Department. He handles necessary changes in and additions to the highway facilities. Since the State Traffic Engineer is part of the State Highway Organization, it is within its activities that we find the place of traffic engineering in national defense.

Highway construction is needed for urban and rural sections of the strategic network. Often this work consists of the widening of pavement and shoulders. There are times when it consists of relocation in which by-passes frequently come up for consideration. A second type of highway construction involves urban and rural access roads to army and navy reservations, rail terminals, airports, and industrial plants. The type of road to be constructed must be decided upon, its traffic capacity and specifications as to load capacity, grade, sight distance, etc. A third type of road construction consists of those roads in military reservations. Highway Departments may or may not be consulted regarding their construction.

The State Traffic Engineer can render invaluable service in the construction of the strategic network by recommending:

1. Proper shoulder widths.
2. Safe locations of wide shoulders when they are not to be continuous.
3. Whether to by-pass as indicated by studies of speed and delay, origin and destination, and future requirements in capacity.
4. Proper ratings of highways according to traffic capacities, composition and speed.
5. Facilities which are needed and discouraging the expenditure of money

for facilities which are not required and the overdevelopment of facilities whose useful life will be short.

6. The proper and adequate signing of highways to provide for the safe and unhesitating movement of traffic.
7. Lane markings in areas where maneuvers might be held at night.
8. The adequate signing of detours.

Convoys in rural areas maintain about 40 yards between vehicles so as to permit civilian traffic to make a passing operation. Where medium or heavy tanks are a part of the movement the situation is complicated at bridges where they take to the center of the roadway and at other points because of their width. When it is considered that a mechanized division would probably be from one to two hundred miles long if extended in a single line, the magnitude of the problem is at once apparent.

It is clear that there would be times when two or more parallel routes might be used to an advantage. It is also apparent that the speed with which a convoy travels could be adjusted so as to interfere least with civilian traffic. In the matter of vehicle speeds and alternate routes the State Traffic Engineer could certainly be of assistance.

When convoys pass through cities they are closed up and carried through in units of 50 to 1,000. Civilian traffic must make way for these groups in the same way it does for the fire trucks of every day life. Military and local police are used to see that this is done. When small convoys engaged in transport of supplies, etc. enter a city it may be well to consider the use of several routes and infiltration into the local traffic streams without making such paralyzing inroads into the normal movement of municipal traffic. The amount of traffic on city streets will vary according to the time of day and where no local traffic engineer is available, the State Traffic Engineer would probably be the only reliable source of information relative to the excess capacity of the several possible routes through the city in relation to the time of day.

In conclusion it may be said that the place of the State Traffic Engineer in national defense is an important one. It is reasonable to assume that he will be called upon more frequently and his work better understood as the armed forces include increasing numbers of traffic and safety experts. Should gas rationing, blackouts, and evacuations become necessary, his work in transportation and traffic control will become more difficult and his opportunities to render an essential service will multiply.

An original paper presented by Adolphus Mitchell (Jun. I.T.E.), Traffic Engineer, North Carolina State Highway and Public Works Commission, at the First Southeastern Traffic Engineering Conference, Clemson, N. C., September 1941.

SOUTH CAROLINA HIGHWAY DESIGN POLICIES

by H. J. Blackmon

IN this discussion on S. C. Highway Design Policies it will be assumed that the location has been definitely established, therefore, no discussion will be taken up on the subject of field surveys.

In the design of a particular highway there are many factors to consider. There are the broad factors such as the integral part of the particular project to the State Highway System, the U. S. System of Highways, the Federal Aid System, and Strategic Network as a whole; and the funds available. These broad factors having been

taken into account, there are a number of specific factors to be considered in the design of each section of highway. Each point will be discussed as follows:

Traffic Density: In the design of any highway, the traffic density is one of the important factors. This factor determines the number of lanes necessary to accommodate the traffic. Highway types used in this State are 2-lane, 4-lane undivided and 4-lane divided.

In designing highways, the future traffic density should be anticipated as far as practicable within the life of the improvement. An increase in traffic density is to be expected after a highway has been improved.

The volume and character of the traffic will indicate the number of lanes required for each flow, but the lane capacity should first be fixed.

After the traffic flows are reduced to lanes, the next step is the selection of the type of road to fit the conditions. The 2-lane road will necessarily be selected as fitting the majority of the rural traffic flows in this section of the country. Wherever justified by the amount of traffic, the 4-lane road separated by a median strip should be chosen. In a few places where speeds are slow or traffic is subject to control by signalization or other regulations, as in the cities, six undivided lanes may be used. Some roads may seem to fall in the 3-lane class. There may be enough traffic to make a 2-lane road crowded at times but not enough to justify the cost of constructing four lanes. There is probably a limit where the 3-lane road should be overloaded or, for reasons of safety, construct a 4-lane divided road. In some cases we are obtaining the right of way for a 4-lane divided highway but only constructing a modern 2-lane road under the original project. This appears to provide the best treatment for the density of traffic that justifies a 3-lane road.

Character of Traffic: Approximately one out of every five vehicles on our State highways is a truck or bus. The remaining 80 percent are passenger cars.

The characteristics of truck and bus traffic have influenced the structural design of highways considerably more than the traffic behavior or operation features. As the truck-traffic increases, greater consideration is warranted in the design of highways to provide for the safe operation of heavier vehicles.

Some geometric design details of our highways are affected by the heavy vehicles on our high traffic density roads. These are mainly: Design of curves at intersections, shoulder width, grades, and length of cross-overs on 4-lane divided highways.

Design Speed: The design speed of a highway should provide for the drivers that will adopt a maximum safe speed. The selection of this speed depends mostly upon the character of topography of the area traversed in rural areas and the cost of right of way in urban areas. Also, the volume of traffic to be accommodated is an important factor in determining the design speed. High traffic density may make it economically sound to provide for a higher speed in rough terrain where normally the design speed would be considerably lower.

It is a definite conclusion that the width of a traffic lane should be greater for higher design speeds due to the greater hazards in driving. The eleven and twelve foot lane widths are used on 4-lane highways, as well as the 2-lane pavements.

At every point along the highway, the motorist should be allowed sufficient time or space to adjust himself to driving conditions, to make allowances for the action of other vehicles, to read direction signs, and to maneuver out of a slight error in driving.

This imposes upon the designer the task of providing adequate sight distance in a longitudinal direction as well as a lateral direction.

Our policy is to provide a minimum sight distance of five hundred feet and on some primary roads six hundred feet. This sight distance is determined by the longest distance in which a driver can see an object five feet above the pavement.

Drainage Structures: Highway engineers have long recognized the importance of proper drainage.

Box culverts range in size from a three foot by three foot to a quadruple ten foot by twelve foot reinforced concrete box. Bridges are used where larger openings are required.

Major structures—that is, structures larger than box culverts—are built of several different types, among them being reinforced concrete bridges, structural steel bridges, or some combination of these, depending upon the class of road.

Subgrade: After drainage, another important part to the life of a road is the subgrade.

Embankments are generally constructed in six inch layers and in some cases tamped with a sheep's foot roller at the optimum of moisture. In cuts where rock is encountered, it is removed to a depth of six inches below the subgrade and backfilled with a suitable material.

Surface Course: The type of surface course is determined by traffic density, character of traffic and funds available.

The standard practice of the Department for the past few years has been to construct 2-lane roads to a width of twenty-two feet instead of the eighteen and twenty foot widths as originally used. It is believed that the cost of the extra width is more than justified by the added safety feature obtained and the lower maintenance costs on shoulders.

Low type bituminous surfacing is usually placed on a natural sand clay or topsoil earth base which is found in sufficient quantities in most parts of this state. However, cold laid high type sheet asphalt is sometimes used in urban areas where curb and gutter are placed.

Our definition of high type pavement is permanent pavement or as near permanent as is possible to construct. Under this classification comes concrete, concrete base with bituminous sheet top, and macadam base with bituminous sheet top. The macadam base produces a semi-rigid pavement which is especially adapted to heavy weight traffic.

Our 4-lane divided roads have been constructed with lane widths of twenty feet with a median strip twenty feet wide. Our most recent project of this type provides for twenty-two foot widths. Twenty feet does not seem to be ample for divided roadways.

Four lane undivided roads have been constructed in and adjacent to towns. The minimum width for this type is forty feet and parking should be prohibited if the road is to be used as a 4-lane road.

Shoulders: Many of our primary roads were constructed with narrow shoulders which are now outmoded for present day traffic. Main roads now have a minimum shoulder width of eight feet, and some are now being constructed with ten foot shoulders.

We have found that some sort of selected material placed on the shoulders with a grass sod—usually Bermuda—prevents washouts and greatly reduces maintenance costs.

Slopes and Ditches: One to one cut slopes and one and one-half to one fill slopes have been standard practice for this Department except in special cases. Most widely used now is our 32'-40' typical section for secondary roads — that is, thirty-two foot fill width from shoulder to shoulder and

forty foot cut width from ditch to ditch line.

From past experience we have found it necessary in some localities to give special treatment to ditches. Due to the nature of our soil and the volume of water to be handled, serious erosion of ditches has taken place. We have tried to remedy this situation by either sodding the ditch, constructing rock breaks or placing concrete valley gutters with storm sewers.

On the primary two-lane roads and the four-lane roads where flat back slopes are used, recent practice has been to place four inches of selected material in preparation for beautification. The edge of the slopes also have a ten foot rounding which adds greatly to the appearance of the road.

Roadside improvement consists of planting native trees and shrubs at the proper places and the planting of vines in deep cuts—some of which are terraced—in order to prevent erosion.

Grades: Probably the most widely discussed and debated point in the design of any highway is the question of grades. The topography of the area traversed controls the gradient. In our State, grades of five per cent or more are seldom encountered. However, it is sometimes necessary to use five per cent grades or greater for economic reasons. We do not believe that this is excessive, provided these steep grades are short and minimum sight distances of five hundred feet and over are maintained. Trucks are unable to negotiate long, steep grades except at dangerously low rates of speed and these should be avoided.

Vertical sight distances for non-passing can usually be had without much difficulty except in extreme cases. Passing sight distance at frequent intervals also can usually be had except in rather mountainous country where proper alignment cannot be obtained.

Horizontal sight distances do not present a serious problem except at intersecting roads. This will be discussed later under the item of intersections.

Condensed from an original paper presented by H. J. Blackmon, Chief of Surveys and Plans, S. C. State Highway Department, and at the First Southeastern Engineering Conference, Clemson, N. C., September 1941.

Editor's Note: Mr. Blackmon's treatment of intersections will be published next month as a complete article.

THE ANALYSIS AND USE OF FIELD STUDIES AND ACCIDENT FACTS

by VIRDEN A. RITTGERS

THE day has long since passed when the traffic problem could be effectively dealt with on the basis of guess work and off-hand opinions. It has become too important, too complex, and—shall we say—too unsatisfactorily handled. The foundation of any attack should be predicated on facts. Facts, in the traffic field enable us to discover *true conditions* and *causes*—which is aboslutely essential to the effective remedying of existing problems or the successful planning for future traffic facilities. Successful traffic enforcement and educational programs of a community are likewise guided intelligently by dependable traffic data.

This general procedure is—we might say—routine with traffic engineers and they have proved again and again the importance of adequate traffic data.

This subject is so broad and extensive that it should be stated that the purpose of this paper is merely to help provide an outline by traffic engineers.

Three Basic Elements: In order that a traffic survey or study shall be *vital,* it is important constantly to bear in mind these three elements: (1) collection of data, (2) analysis of those data, and (3) application of the remedies or corrections dictated by the conclusions drawn.

Accident Studies: The general use of accident data concerns the discovery of clues to, or causes of, traffic accidents. Specifically their use may concern signal, sign or marking installations or revisions; parking regulations; view obstructions; driver and pedestrian factors; roadway physical factors; vehicle factors, etc.

The official accident reports constitute the most common and most reliable source of accident information. Standard accident report forms developed by the National Safety Council and the I.A.C.P. are being used more generally every day by city and state police departments. These forms provide a mass of detailed data and they represent quite a financial investment of public funds which can be justified only if the data is put to constructive use for the public good. Accident reports must be filed by *location* in order that those concerned may "put their finger" on the reports for a given location under study.

Using the Accident Reports: The more usual specific uses of the accident reports are to provide: A master spot map of accident locations; supplemental spot maps of pedestrian accidents, night or day accidents, accident-driver residence locations, accidents per month, etc.; high-accident street and "worst corner" lists; collision diagrams which show graphically the detail location, manner of collision, time, etc. for selected "sore" spots; "before and after" studies where improvements or changes have been made, etc. As an example, such a study recently made in Richmond, where a poorly located traffic signal had been installed on U. S. Route 1, revealed a 375% increase in right-angle collisions and the involvement of foreign drivers in 55% of those collisions, compared to the record before the signal was installed.

Vehicle Volume Counts: The general uses of volume counts concern need or justification of street improvements; special routings for heavy trucks, army convoys, etc.; through street systems; one-way streets; traffic signal warrants — actual or relative; signal design and operation; street lighting facilities; accident-volume ratios; traffic police assignments, and general city planning studies.

Methods of recording vehicular flow in the field include use of hand tally forms, hand counters or tally machines, the short-hand method (for brief checks) and automatic, electrical devices.

Graphical records of flow data may readily be prepared from summaries of the field data, in the form of flow charts, flow maps and curves.

Pedestrian Volume Counts: Pedestrian volume counts may likewise be valuable in the determination of: need for separate pedestrian signals; street crossing and jay-walking practices; signal timing and school child crossing and routing habits.

Vehicular Speed Studies: The uses of data on vehicular speed practices may be listed principally as follows: determining locations of excessive speed for the conditions; checking "speeding" complaints of citizens; cross checks with accident analyses; determination of proper maximum speed limits — blanket limits and speed zoning projects; signal timing co-ordination and amber clearance interval lengths; proper size, type and location of traf-

fic signs and markings; selective enforcement programs; critical speed computations; measurements of delay and congestion; "before and after" studies to determine effectiveness or control measures, regulations, etc. and to a limited extent the actual apprehension of violators by the police.

The fallacy of off-hand estimates of speed is illustrated by a recent case in which a high ranking and competent traffic police officer asserted that ¾ of the vehicles on a certain route travelled in excess of 35 m.p.h. whereas an actual speed check revealed only 15% exceeding 35 m.p.h.

Methods of measuring vehicular speeds include stop-watch recordings over measured courses using marks on the pavement, mirror boxes along the sidewalk area, signals from an additional observer or electrical timing devices. Speed (or delay) through congested area is also frequently measured by "floating" with traffic in a test car.

Street Parking Studies—Uses of data on vehicular parking on the street will usually concern either parking needs and capacities or parking hazards or interference. Capacity studies may involve such factors as: existing working capacities at the curb; need for installation or revision of parking time limits; justification of parking meters; demand for off-street parking facilities; and time limit violation studies.

Studies of hazardous parking practices may involve investigation of such factors as: head-in or diagonal parking; view obstruction caused by vehicles parked near corners, crosswalks or curves; double parking, and parking in prohibited zones.

Field procedure in street parking studies involve the observation and recording of location, duration and manner of parking and, frequently, the determination of the purposes behind such parking.

Off-Street Parking Studies: Off-street parking studies naturally are closely related to street parking studies. The inadequacy of street parking space, where it is found by survey to be an actuality, means that facilities, both existent and potential, other than public streets should be inventoried as to location, value, suitability and capacity. Extensive economic study is necessary to determine the best methods of development and operation. Several kinds of traffic surveys may be required for an off-street parking study — such as: volume counts, cordon counts and origin and destination surveys.

Violation or Observance Studies — Various kinds of observations are frequently made to ascertain the facts as to driver and pedestrian response to regulations or control devices. Such data is invaluable in determining the effectiveness of new measures or revisions of old measures. More commonly such checks are made concerning stop signs, traffic signals and speed limit and parking provisions.

Cordon Counts—A Cordon Count consists, in general, of recording all vehicles and persons entering and leaving a given *area* by half-hour intervals during a selected period — usually a typical business day. Observers are stationed in a "ring" at all points of entry or exit and separately record pedestrians, mass carriers, commercial vehicles, taxi cabs and private vehicles.

Uses to which Cordon Count data may be put include: parking facility studies; determination of relative importance and efficiency of various modes of transportation; planning or adjusting mass carrier schedule; planning police assignments; fitting signal operation to traffic needs; and in conjunction with street improvement or city planning studies.

Origin and Destination Studies — This study, as its name implies, consists in learning where the vehicles found travelling a certain route came from and where they are bound.

Such surveys have more frequently been made by state highway departments and larger municipalities in determining justification of, or planning proper location for, by-pass or alternate routes, bridges, etc. A much more extensive use by smaller jurisdictions of O-D studies is certainly justified in order to more intelligently guide the expenditure of public funds for various street improvements.

Three of the several methods of making O-D surveys are: interviewing drivers; handing drivers a self-addressed card to be filled in and mailed; and attaching coded cards to the vehicle, to be picked up by other observers if the vehicle passes their station.

Other Traffic Surveys: There are numerous other kinds of traffic surveys or variations of regular type surveys which involve the obtaining and analyses of field data. Some of these are: trade practice surveys; loading zone studies; vehicle weight or condition surveys; pavement skid co-efficient studies, etc.

Some Practical Hints: Organize and plan thoroughly for a survey before beginning work:

Fix clearly in mind and keep in mind, the *end result* which is sought from an investigation.

Be accurate in both field and office work but don't waste time and money by being unnecessarily accurate. The beginner in traffic studies should go slow about "short-cuts." Experience and a reasonably practical mind will gradually teach *the time when,* and the *limit of,* satisfactory short-cuts.

Key personnel must be trained. All personnel must be trustworthy.

Remember that an elaborate survey, ably directed and skillfully analyzed means little more than wasted money unless something is done about it. If the study may result in recommendations requiring selling, think about that selling job before making the survey or study.

Avoid being lead astray by so-called "common sense" solutions to traffic problems. Such solutions most frequently are evidence that the idea's author knows little, if anything about his subject. Stick to your guns—that is—obtaining the facts and studying them. Then be *practical* in arriving at your conclusions.

Keep abreast of the profession on technique and practices in traffic studies. Additional and much more complete and thorough information on how to make and use the various field studies mentioned in this brief paper may be obtained from several sources, some of which are as follows:

Institute of Traffic Engineers

National Safety Council

American Automobile Association

Public Roads Administration

National Conservation Bureau

Conclusion: The analysis and use of field studies and accident facts is the scientific — the only intelligent and practical basis of approach to the successful handling of a city's biggest governmental function — transportation.

Condensed from a lecture given at First Southeastern Traffic Engineering Conference held at Clemson College, September, 1941, by Virden A. Rittgers (Assoc. I.T.E.), City Traffic Engineer, Richmond, Va.

HANDLING TRAFFIC AT SPECIAL EVENTS IN CHICAGO

by OTTO K. JELINEK

THE Traffic Section, Engineering Division maintains a Special Event Section. This section is primarily designed to render service to the public and assist them in obtaining maximum usage of the facilities offered by the Chicago Park District. To be effective, such a service must not only have as its goal the strict enforcement of the Chicago Park District Code, but it must also provide assistance in planning, scheduling, and maintaining supervision of all activities affecting the traffic problem.

This section in handling the many diversified special events that take place in the Chicago Park District proceeds in somewhat the following manner:

Upon being advised of an event, a meeting is held with the sponsor, and the sponsor's needs and the problems he faces in making the event a success are discussed. It is thus possible to assist the sponsor in his planning and point out the wisdom of using a suitable location before his plans are crystalized or have received public notice or acceptance. This plan is, in reality, educational since through it the sponsor becomes aware of the advisability of consulting the proper authorities before arranging final details, setting dates, or releasing information to the press. The Traffic Section, after receiving all available information, is in a better position to study the problem and to formulate plans to effectively handle the public attending the event.

After all possible information has been gathered and a tentative plan agreed upon, a general meeting is called, which includes the Chicago Park District Chief of Police, the City Chief of Police, representatives of the mass carrier companies (who will transport the public to and from the event), the sponsor, and all other interested parties. The plan is then thoroughly discussed, and a bulletin is prepared covering all pertinent information regarding the event. A map is prepared to accompany the bulletin showing the location of the area where the event is to be held, directions for reaching the event by mass carriers, the available parking space for motorists, and other necessary information. This bulletin is signed by the Chief of Police and the Traffic Engineer and becomes the order of the day for all police and employees of the Chicago Park District.

The bulletins and maps are then mailed to all local newspapers, radio stations, transportation companies, the sponsor, and any other parties directly or indirectly concerned. Through newspaper publicity, the general public is advised as to the best routes to and from the event in order to minimize interference with other traffic and to promote public safety. During large special events, of necessity the mass transportation carriers run additional service and maintain new schedules. This service and these schedules are publicized in order that spectators who avail themselves of the use of mass transportation carriers can be transported to and from the event with the least amount of inconvenience. This publicity also permits owners of commercial and private vehicles not interested in the event the opportunity of circumnavigating the area where the event is held.

In connection with the issuance of bulletins, the Chicago Park District

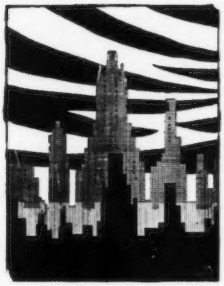
issues official stickers for official cars and other vehicles requiring quick access to and from the area where the event is held. These official stickers are distributed by the sponsor inasmuch as the sponsor is in the best position to handle the distribution. The stickers are so designed that they cannot be duplicated and a new sticker is issued for each event with some change in the design.

By virtue of proper planning, the Chief of Police of the Chicago Park District can intelligently assign the necessary number of police to handle the event without impairing the performance of other regular police activities; the transportation representatives can so schedule their service as to accommodate the greatest number of spectators in the shortest possible time, and have proper transportation facilities available when needed.

The Traffic Section assigns parking guards to assist the police and the public in parking cars and other vehicles so that greater efficiency may be obtained in the use of the available parking areas. These parking guards also maintain a patrol during the event in order to curtail vandalism, report any fires that may have started through crossed ignition wires, and in keeping with the present safety movement to make further reduction in the traffic toll, the parking guards are also assigned to pedestrian control. Temporary fences along major arteries adjacent to locations where special events are being held are set up channelizing pedestrian and vehicular movements, all of which considerably reduces the possibility of traffic accidents, as well as facilitates the movement of both pedestrian and vehicular traffic.

During the event, observations are made in order to determine whether the plans as outlined in the bulletin are practical and efficient and whether the outline is being adhered to. A report is made of this observation covering the following points: The weather, condition of the pavement, starting time, finish time, time the area was cleared, attendance, mode of arrival with a breakdown showing the percentage using the various mass transportation carriers, the number of cars and other vehicles parked, the effect the event had on traffic, the number of police assigned, the number of barricades used, the number of parking guards assigned, the official handling of the event, the general conduct of the spectators, the number of accidents and first aid locations, and any other pertinent remarks that may serve as a guide for planning similar future events. By means of these reports when further events are contemplated, an intelligent analysis of the situation can be made and proper plans formulated. These observations are also studied when new traffic arrangements are contemplated in order that the best interests of the majority may be properly served and any impractical arrangement eliminated at the very start.

An original article by Otto K. Jelinek (Mem. I.T.E.), Traffic Engineer, Chicago Park District, Chicago, Ill.



Stop, Look and Listen

The Institute takes pleasure in announcing the new

OFFICERS AND MEMBERS OF THE BOARD OF DIRECTION

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Harold F. Hammond, Vice-President

W. Graham Cole, Secretary-Treasurer

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Edward J. O'Meara
Thomas J. Seburn

Hawley S. Simpson
Leslie J. Sorenson
Arnold H. Vey

PERSONALS

Grant Mickle and Wilbur Smith are to deliver papers at the American Association of State Highway Officials' meeting in Detroit.

Bernie Hartung has begun another year as chairman of the Traffic Engineering Committee of the Western Association of State Highway Officials.

In the Port of New York Authority's reclassification of employees Nathan Cherniack's title has been changed from "Statistical Analyst" to "Economist" and Roger Gilman's from "Statistician" to "Junior Economist."

NEW MEMBERSHIP APPLICATIONS

Edwin Eugene Cherry

Traffic Engineer (Acting), Road Department, County of Los Angeles, California; (home) 1414 Euclid Avenue, San Gabriel, California

Richard A. Wilson

District Traffic Engineer, Division of Highways, District X, 1200 N. Center Street, Stockton, California; (home) 1139 North San Jose Street, Stockton, California

Convention Highlights

REFLECTIONS OF 1941

The retiring president, Hawley S. Simpson, gave the opening address of the convention entitled "Reflections on 1941." He made note of the fact that the I.T.E. was meeting in a time of serious trouble and consequences to ourselves and our profession. Particular emphasis was placed upon the fact that we must make the most of what we have and do "more and more with less and less." He also stressed the importance of persuading officials to make more use of traffic engineers.

INSTITUTE POLICIES

Leslie J. Sorenson, Chairman, Policy Committee presented the report. The policy of the I.T.E. is to conduct projects of a research, advisory character in cooperation with other organizations that are also concerned with traffic engineering and traffic safety. There are 15 projects on which I.T.E. has cooperated, either through a committee or through a single representative.

Illuminating Engineering Society—Developing traffic warrants for street lighting installations. Held meeting of I.T.E. and I.E.S. Committees in Chicago in May 1941. Howard Ilgner is I.T.E. Committee Chairman.

President's Proclamation Program—Mr. Simpson, represents I.T.E. in cooperation with National Safety Council.

National Electric Manufacturers' Association—Mr. Brandes is I.T.E. Chairman. "Specifications for Traffic Signal Heads" approved by Committee from I.T.E. and N.E.M.A. The next step is to secure adoption of these specifications as a national standard by the American Standards Association through its Committee on Highway Traffic Standards.

Traffic Engineering Handbook—Cooperation with National Conservation Bureau, Messrs. Sorenson and Hammond representing the Institute and N.C.B. respectively as co-editors.

Highway Traffic Standards Committee—I.T.E. is represented by Mr. Vey. Several projects are being prepared for presentation to the American Standards Association for adoption, and a meeting will be held shortly.

Highway Research Board—Mr. Vey has been serving as the representative of the Institute during the past year. The activities of the Institute on the Highway Research Board are reflected in the Proceedings of the last Annual Meeting of the Highway Research Board.

A.S.A. Section Committee D-7—Standard Code for Motor Vehicle Inspection. Representative, Mr. McCracken. Brake recommendations will be made as soon as the U. S. Bureau of Public Roads working with the I.C.C. Bureau of Motor Carriers completes its field tests of over 3,000 vehicles.

American Public Works Association—Representative, Mr. Burton Marsh. Through the efforts of Mr. Marsh a section was included in the 1940 Public Works Engineers Yearbook entitled "Metropolitan Traffic Troubles." Through contact with this organization, the Institute is helping to develop sound traffic engineering programs in municipalities.

Safety Convention Programs—The I.T.E. assisted in developing traffic en-

gineering and/or safety sessions at the following conventions during 1941: Midwest Safety Conference, Greater New York Safety Convention, Street and Highway Traffic Sessions of the National Safety Congress. Representatives were Mr. Abbott, Mr. Kraft and Mr. Reeder.

Committee on Traffic Engineering Training—Chairman, Roger L. Morrison. This Committee assisted in developing the Traffic Engineering Course at the National Traffic Safety Institute held in Berkeley, California in August of this year.

This Committee has been active in the development of courses in traffic engineering training through suggesting subjects for inclusion in highway engineering courses and subjects for inclusion in separate traffic engineering courses. At present it recommends that the emphasis be placed on "in-service" training courses for engineers already engaged in traffic work who have not had instruction in traffic engineering principles.

Motion Picture Traffic Safety Committee—Representatives, Mr. Simpson and Mr. Mickle. Through its representatives, the Institute has been assisting the Committee in encouraging the use of Motion Pictures and soundslides to educate the public in safe traffic practices.

National Conference for Uniform Traffic Accident Statistics—Mr. Van Duzer and Mr. W. Smith representing I.T.E. This Committee is now studying revisions for accident reporting systems.

Center for Safety Education, New York University—Mr. Cole, I.T.E. representative, reports that the Institute has not been called upon to meet with the administrative group of the Center for Safety Education for some time and suggests that representation be discontinued until such time as the Institute is called upon again, at which time a new representative can be selected.

International Association of Chiefs of Police—Chairman I.T.E. Committee, J. B. Baker. The purpose is to develop warrants for traffic officer control at intersections. Mr. Baker reports that the joint committee with the I.A.C.P. has met four times during the past year. They have received data on 80 intersections in 9 cities having a large volume of traffic without officer control. Eventually it is hoped that these studies will indicate what conditions warrant traffic officer control at intersections.

DEVELOPING I.T.E. STANDARDS

Mr. William C. Brandes (Mem. I.T.E.), Chairman of Committee on Standards and Specifications, stated that a new contribution of this committee now available is a standard specification of Pre-Timed Fixed-Cycle Traffic Signal Controllers including a lengthy set of definitions of technical terms. The purpose of this specification is to aid the traffic engineer in purchasing signal controllers and the manufacturer who may bid on the specifications. Such standard codes bring about greater uniformity of all traffic control devices for the mutual benefit of the general public. These were adopted as a tentative standard and will be printed in the Proceedings.

T. E. INSTRUCTION

The report of the Committee on Traffic Engineering Training,, R. L. Morrison, Chairman, stressed the need for more "in-service" training of men employed in traffic activities rather than more undergraduate courses in traffic engineering. This in-service training is provided primarily by two-week intensive courses given by experienced traffic engineers.

RESEARCH PROBLEMS

Wilbur S. Smith, Chairman, Committee on Cooperative Engineering Research, outlined three projects which the Committee has under consideration for cooperative action with the American Association of State Highway Officials and the U. S. Public Roads Administration.

Revision of Manual on Uniform Traffic Control Devices.

A Study of the State's Responsibility in Municipal Traffic Problems.

Coordination of Traffic Engineering and Highway Planning Activities in States.

The projects were approved by the committee and by the president and board of direction of I.T.E. and were submitted to the A.A.S.H.O. committee, of which Mr. Rosenwald is Chairman. Mr. Rosenwald's Committee approved of recommendations and has submitted them to the President and Board of Directors of the A.A.S.H.O.

The Committee on Planning and Traffic Engineering of the A.A.S.H.O. was just authorized to develop a working plan with the U. S. Public Roads Administration for a revision of the Sign Manual. The Institute will be requested to take part in this Project.

These three joint projects are believed to incorporate the most important needs for traffic research and the Institute membership voted that they should be continued.

EVALUATION OF NIGHT VISION TESTS

Earl Allgaier, Asso. Personnel Technician, War Dept., reported that since much of the driving during war conditions must be done at nights without lights, it is important to select drivers upon reliable tests.

The Military Training Center at Fort Belvoir undertook an evaluation of several tests with 30 drivers. The ones giving the most consistent results were Biophotometer, AAA Test and Intensity Discrimination Chart of Doctors Luckiesh and Moss.

Subjects were tested on the road at night by measuring the distances at which they could see 20 targets on the edge of the road spaced on an average about 250 feet apart.

The Biophotometer and Snellen chart gave results most closely related to the road test.

In a preliminary study of over 1000 cases tested on the Wald Adaptometer indicated that there was no significant difference in the scores made by colored and white drivers and no significant effect indicated if a sugar solution were taken one-half hour before testing.

MILITARY TRAFFIC ENGINEERING

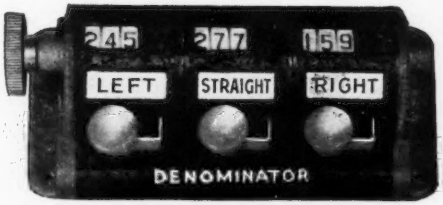
Speaking before the Institute, Captain Warren S. Everett, C.E., reports the following: About a year ago the Corps of Engineers was assigned to improving military textual material pertaining to traffic control and to organize existing civilian traffic agencies into a nation-wide traffic control system.

War Department training Circulars No. 11 and No. 35 were prepared setting forth procedures executing this coordination. This problem has been attacked from an engineering approach and reserve officers were called to active duty from the civilian traffic engineering profession.

Techniques of military traffic methods abroad were studied and later supplemented by large scale field tests. One important revision was the development of a type of column spacing in terms of time rather than distance. Surprisingly accurate measurements of time intervals can be obtained from the quick time cadence of close order drill. This method of counting the distance almost entirely eliminates the "whip" or "intracolumn

TRAFFIC COUNTING SIMPLIFIED WITH NEW TRAFFIC COUNT DENOMINATOR

Illustration of 3 unit Counter, classifying directions of travel



Other models with from 1 to 12 classified counting units mounted in horizontal line.

By simply pressing key one count is recorded in classified counting unit controlled by that key. •

Touch method employed permitting operator to keep eyes on road at all times. •

Quick reset returns all counting units to zero. •

Counting units may be classified to represent direction of travel, different types of vehicles, state license plates, and other important classifications in traffic planning. •

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Quick . . . Accurate . . . Efficient.

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interference" when used in columns of 50 vehicles or less and columns of 500 to 600 vehicles can be easily handled with this method.

Another method for passing military columns through civilian communities under non-tactical conditions is that known as "infiltration" where vehicles are dispatched at intervals of from 30 seconds to 2 minutes apart. This procedure enables a column to pass through a community without local police escort or special local traffic arrangements. Civilian traffic crossing the column is not delayed and public respect for the army is enhanced when military drivers are required to comply with red lights, stop signs, reasonable local speed limits, and other civilian traffic regulations.

Traffic capacity studies with columns composed of approximately 300 miscellaneous military trucks showed that traffic flow increased as a direct function of speed up to a speed of approximately 25 miles per hour. Above 25 miles per hour, no further increase in traffic flow was observed. The average traffic flow obtained with these trucks at 25 miles per hour and greater speed was 1,200 vehicles per hour.

Civilian traffic signs are found not to be suitable for military needs in the combat zone because of their weight and bulk, difficulty of procurement, lack of flexibility and resistance to rapid destruction. A new series of rounded letters has been developed which give approximately 11% greater legibility than the block letters of the

Public Roads Administration Standard "D" series.

Other methods for improving traffic movement developed by the Army are an all-welded steel overpass bridge made up of 5 bays weighing about 5 tons each, traffic direction by low flying aeroplanes and system of radio control similar to that used on the George Washington bridge. Much has been done to improve operation under blackout conditions including a study of "glare camouflage" to protect vehicles on the open road on moonlight nights or when road is lighted up by flares.

Captain Everett personally estimates that the Army will require approximately 200 or 300 specially trained officers and several thousand enlisted men for assignment to field traffic units and a number of additional traffic officers to fill the post of traffic engineers at the larger military camps.

In closing he expressed the War Department's appreciation for the tremendous assistance which the Institute of Traffic Engineers through its members have contributed in the formulation and carrying out of the Army's military program.

A CITY GOVERNMENT'S RESPONSIBILITY FOR SAFETY

Mr. Ross L. Leffler of the Better Traffic Committee of the City of Pittsburgh stressed in his paper the following: City Government's responsibility to safety is in every City Charter.

Unfortunately a lack of a thorough knowledge of the safety and an indifferent public toward enforcement of traffic regulations are obstacles which must and will be removed.

Traffic Engineering is of utmost importance. The streets and highways are inadequately designed to carry the present volumes of traffic expeditiously and safely. Special privileges, such as street loading and parking are selfishly demanded by business establishments. The restrictions as to turns are usually bitterly opposed by those establishments that are located nearby.

This combination of erroneous practices has resulted in serious congestion. While accident statistics have proved that not many serious accidents occur in these congested locations, opinion is that this series of delays are considerably responsible for a large number of the accidents. This stop and go driving unquestionably has considerable effect upon the attitude of the driver and probably has much to do with his "stepping on the gas" when driving on the less congested streets. Congestion is drastically reducing property valuations in many sections; therefore it seems to me that more intensive efforts should be made by traffic engineers and other city officials in solving this complicated problem of congestion.

The present traffic death rate and injuries of pedestrians is often blamed on the unsafe walking practices, but I believe many of these accidents were due to inadequate traffic protection.

Traffic engineering can function properly only when improvements and installation of traffic equipment are made on the basis of actual data.

There is a panacea for today's traffic ills. The problems which confront any community of any size can be worked out if the prescribed and proved methods of traffic Engineering, Education and Enforcement are adopted. Intrinsically each city official desires to do the right thing. When a city administration deviates from the proper applications of traffic safety methods, we must go behind the curtain front and talk with the men who are pulling the ropes. Where you find a favored group of persons, you will find your safety program crumbling with pettiness. The public will not subscribe to its program.

ELECTRIC SIGNALS

Standard signals adapted for all types of mounting. Synchronous and induction control mechanisms and accessory devices.

REFLECTOR SIGNALS

When signs are not enough or expense is a factor, reflector signals keep down both cost and accident rate.

8": Six 1⅝" Stimsonites

15": Six 3" Stimsonites

REFLECTOR SIGNS

Large Stimsonized and standard reflector button signs for all traffic conditions.

72" SIGN
18" LETTERS

24" SIGN
6" LETTERS

DELINEATORS

Reflector Delineation gives essential road information after dark at daylight distances. The alignment and driving limits of the road are outlined by a channel of light.

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It is therefore necessary that we convene with the administration and present the problem to them, and learn of their problems. An advised and desiring administration coupled with an aroused public will bring into focus the maladies; then the proper techniques of the three E's must be applied.

A citizens' committee in your own community can accomplish what might otherwise be a futile attempt of your administration. A citizens' committee must stand its ground. The personnel who are hired to carry out its activities must have but one aim in mind—the saving of human lives and lessening of congestion and not the appeasement of persons.

THE STATE GOVERNMENT'S RESPONSIBILITY FOR SAFETY

This paper was delivered by Harry C. Coons, Deputy Michigan State Highway Commissioner, representing Governor Murray D. Van Wagoner.

The State's assumption of the responsibility for traffic safety is a reasonable one, but the development of adequate and coordinated safety programs failed to keep pace with the construction of highways and the general growth of vehicle transportation.

At the last session of the Legislature a bill was passed entitled, "An Act to create the Michigan state safety commission for the promotion of greater safety on the public highways and other places within the state of Michigan; to study traffic conditions; to investigate and eliminate menaces to public safety; to form the Michigan safety council and appropriate moneys therefore."

The Commission shall be made up of the Governor, the Secretary of State, the Superintendent of Public Instruction, the State Highway Commissioner, and the Commissioner of the State Police. An annual appropriation of $20,000 from the operators' and chauffeurs' fund is provided for the Commission.

Our program of national defense demands that the workers reach plants with a minimum of congestion. In Detroit alone even under normal conditions, it is estimated that some $28,000,000 is lost due to traffic congestion annually. The present is the time for the State to pass the necessary legislation to provide the forceful attention required to curtail if not completely erase the appalling tolls due to automotive traffic.

MASS TRANSPORTATION AND SAFETY PROGRAM

Mr. J. P. Tretton presented this paper on "Value of Transportation Company Participation in a Community Safety Program."

At the 1939 Conference of the American Society of Planning Officials, it was stated that planners—"Would be better qualified to create new urban patterns if they were more fully informed of the problems of public transportation." And that public transit "Was an issue of tremendous significance to millions of city dwellers."

Public officials are beginning to realize the value of giving fair and proper consideration to users of mass transit vehicles. Such public consideration will bring about improvement in traffic conditions in our communities at a minimum cost because of the development and fuller utilization of existing public transit facilities.

Since 1932, the transit industry has made definite and substantial improvements through the modernization of plants, equipment and all phases of operation. In the very depths of the depression one company launched a complete modernization program costing $8,000,000. With this modern equipment it was possible to facilitate the movement of traffic generally throughout the city. A substantial

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number of lines that had formerly terminated in the downtown district, with attendant turning movements, were through-routed, making it possible to reduce the number of turning movements very materially. The people began to use public transit service more frequently and helped to reduce the traffic congestion.

In the transit industry, with its 215,000 employees, the record of turnover is less than 3½%. Nearly 80% of transit employees, in this country, have had 5 or more years of service.

The safety record of the transit industry is only 1.8 passenger fatalities per one billion passenger miles. This is the result of continuous and intensive efforts and the careful training and supervision of the employees, regular and rigid inspection of transit vehicles and the addition in 1938 of an accident research staff under the direction of Merwyn A. Kraft, Accident Prevention Engineer, of the American Transit Association.

TRAFFIC ENGINEERING AND THE POLICE IN SMALL COMMUNITIES

Harold Hammond entertained the following thoughts in his paper "Traffic Engineering Function of Police Departments in Small Communities." Police departments are not anxious to do traffic engineering and municipal engineers are reluctant to assume these functions. Attention must be focussed

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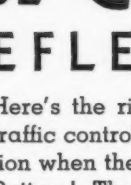
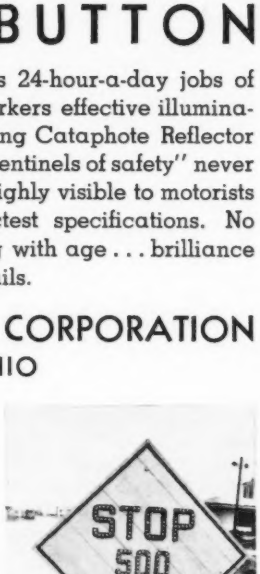


Right—Here's an example of Cataphote Reflector Buttons on special wood signs.

•

Below—Unretouched photograph of Pennsylvania Turnpike with Cataphote Niteway Outliner installation.



on encouraging municipal engineers' interest in traffic.

The police are having to do traffic as an added function and in doing so find it necessary to approach the problem in a piecemeal manner.

Safety councils, auto clubs, transit associations and state highway traffic divisions should support a program for cooperation by municipal engineers and police departments with the end product the appointment of a full-time traffic engineer.

SPEED ZONING

Mr. Darrell in his paper "Establishing and Enforcing Speed Zones on Rural Highways" enlarged upon the following points:

Techniques have been developed for the determination of reasonable and proper speed limits. There is a definite need for the establishment of warrants to select those routes on which speed zoning is to be applied. Speed zoning is manifestly ineffective unless accompanied by at least a reasonable amount of enforcement. Unreasonable restriction encourages a disregard and destroys the confidence of motorists in the judgment of traffic authorities.

Factors warranting speed zoning are:

Recommendations in the 1941 report of the National Safety Council Committee on Speed Regulation.

Divided roadways on insulated rights of way not to be zoned, except in cases where existing statutory limit is unreasonably low.

Unless accidents or other experience indicates winding roads carrying only light traffic should ordinarily not be speed zoned.

Highways with very light traffic will not be considered for speed zoning.

On highways carrying normal or heavy traffic volumes, the character and volume of traffic, the frequency and severity of accidents, driver behavior factors and the physical characteristics of the roadway and adjacent development should all be considered in speed zoning warrants.

The physical characteristics, such as lane widths, type and condition of surface, shoulder conditions, alignment, grades, sight distances, and roadside uses, will all effect the determination of the maximum safe speed.

In Minnesota speed zoning has generally been confined to locations where some restriction was needed since there is a prima facie 60 m.p.h. daytime limit.

In zoning rural highways Minnesota has largely disregarded sight restrictions due to vertical curvature. Poor shoulders along 16 and 18' pavements will necessitate lower speed limits.

Probably the most troublesome factor is the unregulated use of the land along the highway. Ribbon developments cause restricted speed limits on newly constructed roads which are designed for safe and convenient travel at much higher speeds.

A "Speed Limit" sign bearing the numerical value of the speed zone being entered and an "End Zone" sign indicating the numerical value of the terminated zone should be posted!

OFFICIALS' PLACE IN PUBLIC EDUCATION

Harry E. Neal emphasized that public officials, especially traffic engineers, must become adept at the sale of their product—safety and traffic facility—if an apparent public indifference is to be replaced with a sincere desire for an improvement. A willingness to accept what the traffic engineers offer can only come about if public officials make their product attractive, demonstrate its worth and prove its effectiveness with facts. Application of the psychology of modern propaganda methods must be made if an official is to win and retain public respect for his contribution.

SPEED ZONING AT ISOLATED LOCATIONS

Foster Kunz, speaking on zoning isolated locations, emphasized the following: The first factor to be considered in the application of speed zones at isolated locations is that of having the necessary authority for such action.

Accident statistics are of fundamental importance. A priority selection of locations can be made by prorating accidents according to severity. Some authorities advocate a value of five be assigned to each fatal accident, three to each non-fatal, and one to each property damage.

It is necessary to weigh all of the other physical and traffic conditions. A curve having a fairly moderate degree of curvature located at the end of a long tangent is, for example, often more critical and serious than a sharp curve located within a section of continuous winding road. The selection of one or more particular routes and completion of the zoning on each before going to the next is advocated.

It is generally advisable to ascertain the 85 percentile (the speed at or below which 85% of the vehicles are traveling) and the "pace of traffic" (that ten mile speed interval having the greatest frequency of observation).

The determination of safe speeds on curves has been done by several methods, the most common of which is through the use of a ball bank indicator. After determining the limits to be posted it matters little whether they are prima facie, absolute or advisory.

At some hazardous locations requiring a large reduction in speed from the prevailing speed, Utah uses a large super-sized sign, which reads, "Slow to — Miles" followed by large warning signs which indicate the hazard ahead. These signs have proven very effective.

ROADSIDE CONTROL

Hallie Myers' paper on Control of Access from Abutting Property Development emphasized the important problem of what to do about access to abutting property developments along our transportation line.

There is a need for access control. Unrestricted development and commercial exploitation of roadsides multiplies the number of approaches and points of intersections, causes parking, prevents smooth and uninterrupted movement, increases the speed differential of vehicles, increases pedestrian movement and thereby increases accidents and reduces road capacity.

The motorist now pays the highway costs, and owners of abutting property should not be permitted to exploit highway traffic for private gain by uses which impair the safety and capacity of the road.

Parkways, freeways and limited access ways are the permanent solution to the access control problem. Such construction, economically unsound on tens of thousands of miles of traveled roads leaves the problem of providing other means of control.

It is only in recent years since the traffic problem has become acute that the courts have held that in the public interest access may be regulated. In Indiana the law gives the State Highway Commission authority to regulate entrances, driveways and approaches connecting with state routes and requiring the Commission to make and publish necessary regulations. (These Regulations will be printed in full in the PROCEEDINGS.)

In summarization it was brought out that access control requires proper enabling legislation, that zoning is the most effective method and that construction of approaches by the governmental unit is the best assurance of control.

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DECENTRALIZATION

D. Grant Mickle, speaking on the effect of Decentralization upon Traffic, said that decentralization causes congestion. There is less efficient use of street spaces and a greater riding habit as a result of the greater latitude afforded by the automobile.

Cordon counts in the largest cities repeated from year to year indicate a practical standstill or decline in the total number of persons daily visiting the central business district, a decline in the number of mass-carriers, and an increase in the number of automobiles and taxicabs. The conversion of passenger travel from mass to individual has brought speed down to walking speeds of 2½ to 3½ miles per hour.

The greatest criticism of city administrations is that they are doing nothing to provide major facilities for traffic. Motorists clamor for highways and parking facilities. Unfortunately, every major facility for motor travel reducing travel time speeds the very processes which have been so instrumental in creating the unbalance of municipal finance.

Broadly speaking, there are two ways in which this problem could be dealt with. One is by restricting unnecesary land sub-divisions and by requiring needed new building construction to attach itself to the developed city. The other is by economic control. This involves coordinated agencies such as the Federal Housing Administration, mortgage companies, limited income corporations (dealing with slum clearance projects), park, school and recreation boards, and transportation companies. A lack of cooperative

action of both governmental and private agencies would defeat any effort to arrest the trend toward decentralization.

If mass transportation facilities are to be further developed as one of the influencing factors, it behooves us to realize that we must first abandon the outmoded belief that such facilities must be self-liquidating.

Planning, therefore, guided by the economic significance of each step will produce a better city, more convenient and not prohibitive in cost.

Decentralization of residential use is already a fact declared Theodore T. McCrosky. It has come about as the result of fast commutation service plus the automobile and has been accentuated by FHA policy of guaranteeing mortgages on small inexpensive homes built on cheap land. Decentralization of business and industry is a fact but in lesser degree.

Adequate solutions for decay close to principal business centers, lack of facilities for interchange of persons and goods between the center and the sub-center, automobile parking space scarcity and high cost in central areas must all be attended to soon.

The solutions appear to be large-scale superblock rebuilding of inlying slum and blighted areas, more effective zoning, express highways about three miles apart, rapid frequent mass transportation, parking meters on business streets that carry light local traffic, offstreet loading space by means of zoning, adequate terminal parking facilities, etc.

Steps should achieve an equitable balance of interests and a balanced economy.

Editor's Note: The preceding highlights are brief excerpts from some of the papers given at the Annual Convention. Complete papers will be published in the Annual Proceedings of the I.T.E.

H-Y DINNER

Freddie Tarbox presided at the annual dinner of the Traffic Research Association in Chicago with 25 members present. Fifteen of those present are members of the I.T.E. A motion was passed to hold a joint Annual Dinner each year of the graduates of the Harvard-Yale traffic schools the Monday night preceding the Annual Banquet of the I.T.E.

ON THE SHELF

A PRELIMINARY REPORT ON HIGHWAY, PARKING, AND RELATED TRAFFIC PROBLEMS, 1941, published by the District of Columbia Department of Highways, 63 pp.

LONG TERM IMPROVEMENT PROGRAMS IN AMERICAN CITIES. Norman H. Gill, Municipal Reference Library, City Hall, Milwaukee, Wisc. 17 pp., price 10c. A summary of methods used in long-term improvement programs in 30 large cities.

PROCEEDINGS OF THE TWENTY-SEVENTH ANNUAL HIGHWAY CONFERENCE, 1941. Published by the University of Michigan, Ann Arbor, Mich. 226 pp., illus.

PERSONAL FACTORS IN SAFE OPERATIONS OF MOTOR VEHICLES. Leon Brody, research associate, Center for Safety Education, New York University. Published by New York University, 96 pp.

LOOKING AHEAD

October 26-29, New Orleans, La.
47th Annual Conference, American Public Works Association, Roosevelt Hotel.

December 1, Week of—Baltimore, Md., Johns Hopkins University
Highway Research Board of the National Research Council, R. W. Crum, 2101 Constitution Ave., Washington, D. C.

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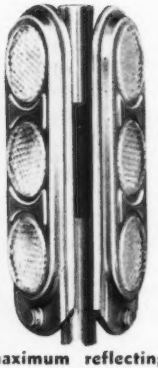

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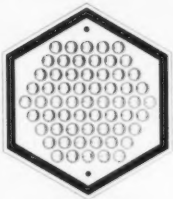

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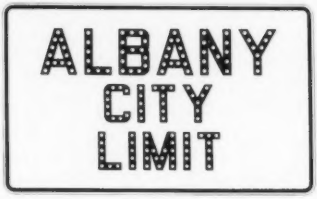

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SPEECH

OF

HON. CLIFFORD DAVIS

Mr. DAVIS of Tennessee. Mr. Speaker, the importance of efficient highway transportation is obvious to any who will give the matter study. Nevertheless, serious street and highway transportation problems have already arisen in many places. The main troubles which decrease the efficiency of highway transportation are delays, congestion, and accidents. In many places I have witnessed serious, if not critical, delays and congestion, and the records clearly show a serious increase in our traffic-accident toll. In fact, highway fatalities are up nearly one-fifth over the toll for the similar period of last year.

Already these problems of highway transportation are causing serious concern to municipal, county, and State officials, especially, of course, in the metropolitan areas and in the vicinity of defense plants and military establishments. What these conditions will be when our productive capacity reaches its peak I do not wish to visualize, for they can have a most serious effect on our defense program. They will have such an effect unless strong corrective steps are taken promptly. For the most part, these steps must look to the better use of the highway facilities we now have. This does not mean forgetting the highway improvements and future developments which are sorely needed, but it does recognize the urgency of our productive effort.

Motor vehicles are our major media for transporting people. In fact, outside of municipalities, there are some 10 passenger-miles by motor vehicle to one passenger-mile by other modes of transportation. Not only is our Army mainly transported over highways, but on my recent trip over a large part of the West and Middle West, visiting defense plants, I saw case after case where plants simply could not be operating in their present location without motor-vehicle transportation for their workers. Seventy percent of workers in car-owning families are said to go to work by automobile.

The wheels of American factories are turning faster and faster, as we move out of the planning and blueprint stage into the period of all-out production for defense and for aid to the embattled nations opposing aggression. Soon our mighty Nation with the greatest productive capacity in the world, will be reaching new heights of production, with vast new floods of materials marking new goals of industrial achievement. We have set ourselves to produce the needed matériel and supplies, and produce them we will. Peacetime businesses and our citizenry are making great sacrifices in order that our production objectives may be quickly achieved.

Much attention has been devoted to organizing our economy, indeed, our very way of life, so that factory and plant production will be expedited to the maximum degree which our excellent manpower, ingenuity, and driving force can make possible. However, in our concentration on increasing production, we have, to a serious degree, neglected an equally vital part of the job we have to do. Efficiency in transportation is also essential if we are to use our shops and factories to maximum capacity and if the finished goods are to reach their destinations on time.

All kinds of transportation are necessary—water, air, rail, and highway. Each has its important part to play, and each must do its part as a member of a great transportation team. The seriousness of transportation trouble has recently been most clearly brought out in the discussion of the gasoline- and oil-shortage problem of the eastern section of this country. At this time I wish to direct attention, however, to that kind of transportation which in many ways is the most important in our defense effort. I refer to highway transportation.

It seems unnecessary to enlarge upon the importance of highway transportation in this Nation which is so much the birthplace and home of the modern automobile. Our 45,000,000 drivers operate 32,000,000 motor vehicles, and some 300,000,000 vehicle-miles per year over 3,000,000 miles of roads and streets. Our Army has become motorized—and with over a quarter million motor vehicles, our Army operates the largest vehicle fleet in the world.

While our magnificent railroad systems carry much greater ton-miles of freight, over 65,000 motor vehicles are used by the railroads in the assemblage and de-

livery of much of that freight and in other phases of their business. Trucks act as feeders to rail transport in many vital ways. Moreover there are some 48,000 communities in this country with a population totaling some 8,000,000, which are served only by highway transportation. Furthermore, in the handling of certain important materials vital to our defense activity, the motor vehicle is the logical and principal transportation medium.

Realization of the vital importance of highway transportation by leaders in our Government resulted in the development of a 75,000 mile strategic network of highways of major importance from a military point of view, and of plans for giving priority to the improvements of certain weaknesses in this network, such as lack of adequate shoulders, weak and narrow bridges, and certain deficiencies in roadway width, and to emphasis on over 3,000 miles of access roads to almost 400 military and naval reservations, airports, arsenals, defense industries, and so forth. These matters and the financing of the necessary improvements are covered in H. R. 5810 as well as flight strips, certain provisions for off-street parking and other related matters such as acquisition of needed rights-of-way for important improvements.

Unfortunately, not enough attention has been given to securing maximum efficiency of highway transportation. Seriously concerned about this situation, the Institute of Traffic Engineers has devised a plan which has my hearty endorsement. This institute is a professional engineering society, made up of those engineering specialists who are devoting their energies to solving problems concerning the use of highways through the gathering of facts and use of the scientific approach to the problem. They are men who believe that problems of traffic will yield best if the key facts are obtained and solutions are designed in light of what those facts show and mean—and not on the basis of the "hunch" or belief or viewpoint of any persons or group of persons.

This professional group was organized in 1930 and now includes most of the practicing traffic engineers of the country. At its annual meeting in Chicago on October 7, 1941, the outline of a plan for immediate improvement of defense production transport was unanimously adopted. It is of such intrinsic value that I desire to present it and to have it reproduced in the RECORD for the benefit of communities throughout our land. I give it my wholehearted endorsement.

It has been submitted to the National Traffic Advisory Committee to the War Department, and I believe it will prove a stimulus to greater activity which will improve the efficiency of our highway transportation system very greatly in the months and years ahead.

The outline of the plan is as follows:

A PLAN FOR IMMEDIATE IMPROVEMENT OF DEFENSE PRODUCTION TRANSPORT

(By Institute of Traffic Engineers, New York, N. Y.)

Congested highways are sabotaging the defense efforts of the United States.

Our streets and roads represent a critically weak link in the production line of national defense.

It is wasteful to spend billions of dollars for national defense unless we can speedily move raw materials to factories, transport workers to plants as quickly as possible, and deliver the finished products before it is too late.

Highway congestion is critical today. But when the defense program moves into full production, conditions on our highways will become intolerable in many areas unless we achieve the maximum use of existing facilities. This will mean less congestion and fewer accidents.

The Institute of Traffic Engineers therefore recommends the following steps as a must program in the interests of national defense:

1. We must plan routes for defense workers and trucks;

2. We must reduce peak-hour congestion through staggering employment hours in defense areas; and

3. We must eliminate traffic bottlenecks.

The Institute of Traffic Engineers therefore recommends that the National Traffic Advisory Committee to the War Department urge each State, county, and city to cooperate in carrying out the Institute of Traffic Engineers plan toward accomplishing these objectives in places where the need exists.

This plan can cut defense traffic delay as much as 50 percent in many places.

I. Plan routes for defense workers and trucks.
   - A. Establish preferential routes for:
     1. Employees.
     2. Trucks.
     3. Mass transportation.
   - B. Bypass congested areas:
     1. Relocate numbered routes.
     2. Provide alternate bypass routes.
   - C. Establish through (stop) streets.
   - D Establish one-way streets.
   - E. Resurface and repair streets

II. Reduce peak-hour congestion in defense areas by:
   - A. Staggering working hours.
   - B. Encouraging civilian traffic to avoid travel during rush-hour periods.

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III. Eliminate bottlenecks:
- A. Control or restrict curb parking and loading and provide off-street facilities.
- B. Channelize traffic for orderly movement:
  1. Lane marking.
  2. Islands.
  3. Intersection redesign.
- C. Install and modernize traffic-control devices:
  1. Signals.
  2. Signs.
  3. Street marking
  4. Street lighting.

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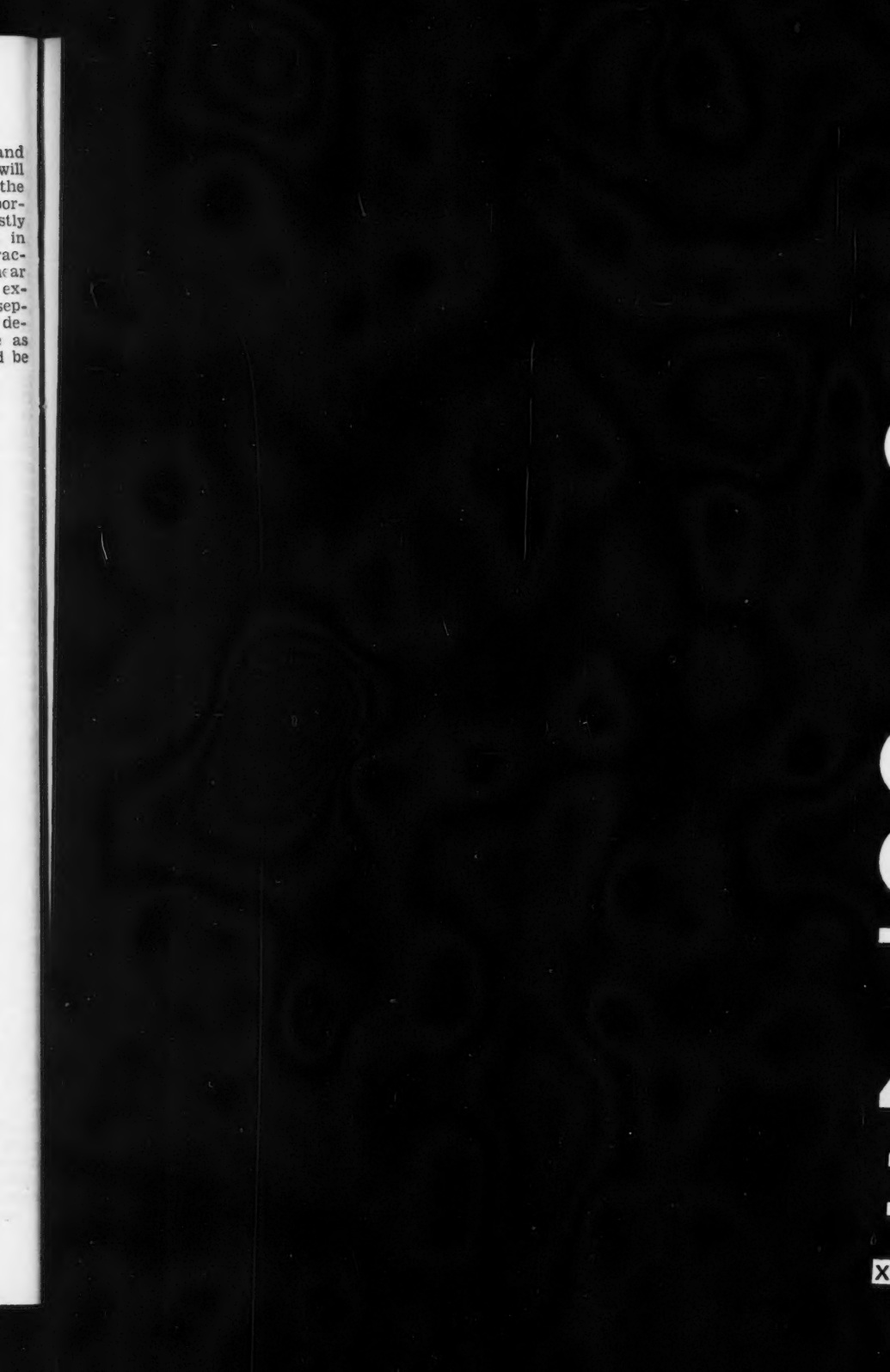
This plan can be applied quickly and economically and if properly applied will provide maximum efficiency from the present system. There are other important new projects which are more costly and take longer to accomplish, but in instances are less costly and more practical than erecting temporary cities near temporary plants. Among these are express streets and highways, grade separations, and the control of roadside development, which are of peacetime as well as defense value. These should be planned now.

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